APPENDIX 5

Proposed Revision to FAR 121.579

Original Text *as of Amdt. 121-265, 62 FR 27922, May 21, 1997*

§ 121.579 Minimum altitudes for use of autopilot.

(a) Enroute operations. Except as provided in paragraphs (b), (c), and (d) of this section, no person may use an autopilot enroute, including climb and descent, at an altitude above the terrain that is less than twice the maximum altitude loss specified in the Airplane Flight Manual for a malfunction of the autopilot under cruise conditions, or less than 500 feet, whichever is higher.
(b) Approaches. When using an instrument approach facility, no person may use an autopilot at an altitude above the terrain that is less than twice the maximum altitude loss specified in the Airplane Flight Manual for a malfunction of the autopilot under approach conditions, or less than 50 feet below the approved minimum descent altitude or decision height for the facility, whichever is higher, except -
(1) When reported weather conditions are less than the basic VFR weather conditions in § 91.155 of this chapter, no person may use an autopilot with an approach coupler for ILS approaches at an altitude above the terrain that is less than 50 feet higher than the maximum altitude loss specified in the Airplane Flight Manual for the malfunction of the autopilot with approach coupler under approach conditions; and
(2) When reported weather conditions are equal to or better than the basic VFR minimums in § 91.155 of this chapter, no person may use an autopilot with an approach coupler for ILS approaches at an altitude above the terrain that is less than the maximum altitude loss specified in the Airplane Flight Manual for the malfunction of the autopilot with approach coupler under approach conditions, or 50 feet, whichever is higher.
(c) Notwithstanding paragraph (a) or (b) of this section, the Administrator issues operations specifications to allow the use, to touchdown, of an approved flight control guidance system with automatic capability, in any case in which -
(1) The system does not contain any altitude loss (above zero) specified in the Airplane Flight Manual for malfunction of the autopilot with approach coupler; and
(2) He finds that the use of the system to touchdown will not otherwise affect the safety standards required by this section.
(d) Takeoffs. Notwithstanding paragraph (a) of this section, the Administrator issues operations specifications to allow the use of an approved autopilot system with automatic capability below the altitude specified in paragraph (a) of this section during the takeoff and initial climb phase of flight provided:
(1) The Airplane Flight Manual specifies a minimum altitude engagement certification restriction;
(2) The system is not engaged prior to the minimum engagement certification restriction specified in the Airplane Flight Manual or an altitude specified by the Administrator, whichever is higher; and
(3) The Administrator finds that the use of the system will not otherwise affect the safety standards required by this section.

[Doc. No. 6258, 29 FR 19219, Dec. 31, 1964, as amended by Amdt. 121-13, 30 FR 14781, Nov. 30, 1965; Amdt. 121-33, 32 FR 13912, Oct. 6, 1967; Amdt. 121-130, 41 FR 47229, Oct. 28, 1976; Amdt. 121-206, 54 FR 34331, Aug. 18, 1989; Amdt. 121-265, 62 FR 27922, May 21, 1997]

Proposed Revised Text

§ 121.579 Minimum heights for use of autopilot.

Unless otherwise approved by the administrator, an autopilot may not be used lower than the applicable heights specified below. Enroute altitudes or heights are considered to be above terrain as applicable to the route flown. For takeoff, approach, or landing, the heights are above the runway touchdown zone elevation, runway elevation, or airport elevation, as applicable.

(a) Takeoff and initial climb.

An autopilot may not be used for takeoff or initial climb below the following height:

(1) Below the value specified in the approved AFM for takeoff, or

(2) If a minimum engagement height is not specified by the AFM, an autopilot may not be used below 500'above the departure airport elevation.

Not withstanding (1) or (2) above, the Administrator may determine that an autopilot engagement height lower than 500 feet above airport elevation, or an engagement height different than that specified by the AFM may be used by issuing operations specifications authorizing an alternate minimum engagement height.

(b) Enroute.

(1) For autopilots certificated in accordance with AC 25.1329 (dated .....), as amended, the autopilot may not be used during cruise at a height less than twice the demonstrated height loss, or 500 feet above applicable terrain, which ever is higher. For autopilots that do not specify a height loss or specify a negligible height loss, the autopilot may not be used during cruise at a height less than 500 feet above applicable terrain.

(2) For autopilots not certificated in accordance with paragraph (1) above, the autopilot may not be used during cruise at a height less than twice the demonstrated height loss, or 500 feet above applicable terrain, which ever is higher. For autopilots that do not specify a height loss, the autopilot may not be used during cruise at a height less than 750 feet above applicable terrain.

(c) Approach.

Except in accordance with section (d) below, no person may use an autopilot during approach at a height that is less than the following, as applicable:

(1) The minimum height specified in the AFM for autopilot approach for the mode(s) used, or

(2) Not lower than a height equal to twice the maximum height loss specified in the Airplane Flight Manual for a malfunction of the autopilot under applicable approach conditions, or less than 50 feet above the landing runway touchdown zone, whichever is higher, or

(3) For systems that are demonstrated to have negligible or zero height loss (below the intended descent flight path) for applicable failure conditions, the autopilot may not be used below 50 feet above the landing runway touchdown zone, runway elevation or airport elevation; or

(4) For systems where a minimum use height, or height loss for approach is not specified in the AFM, an autopilot may not be used at any altitude less than 50 feet below the lowest applicable DA(H) or MDA(H) for the instrument procedure being used, except as follows:

(i) If the pilot determines that suitable visual reference, as specified in § 91.175 of this chapter, has been established during an instrument approach, and can reasonably be expected to be maintained, or

(ii) If weather conditions do not require use of an approved instrument approach procedure, an autopilot may be used for approach no lower than the greatest of the applicable minimum use height specified in the AFM, or twice the

applicable height loss, or 50 feet above the landing runway touchdown zone elevation, runway elevation, or airport elevation, as applicable, or

(iii) If an approved and appropriately functioning autoland capability is used in accordance with section (d) below, or

(iv) If the Administrator issues operations specifications authorizing use of a lower autopilot minimum use height, but not less than 50 feet above the landing runway touchdown zone elevation, runway elevation, or airport elevation, as applicable. Issuance of operations specifications based on this provision requires that the certificate holding office determine that a lower minimum use height can be safely used by that operator, for that operators type(s) of aircraft, authorized airport(s), underlying approach terrain, instrument procedures used, applicable DA(H) or MDA(H), and flight crew procedures, or

(v) If executing an autopilot coupled go-around or missed approach, using an appropriately certificated and functioning autopilot with go-around capability.

(d) Landing.

Notwithstanding paragraph (c) of this section, autopilot minimum use height provisions do not apply to autopilot operations when an approved automatic landing system mode is used. Automatic landing systems may not be used except in accordance with approved operations specifications.

(e) Go-Around.

Following a go-around, unless an automatic go-around is accomplished, an autopilot may not be engaged below the minimum height specified in section (a) above for takeoff or initial climb. For an automatic go-around initiated with an autopilot already engaged, an autopilot minimum use height does not apply. Use of automatic go-around capability must not adversely affect safe obstacle clearance.

[Doc. No. 6258, 29 FR 19219, Dec. 31, 1964, as amended by Amdt. 121-13, 30 FR 14781, Nov. 30, 1965; Amdt. 121-33, 32 FR 13912, Oct. 6, 1967; Amdt. 121-130, 41 FR 47229, Oct. 28, 1976; Amdt. 121-206, 54 FR 34331, Aug. 18, 1989; Amdt. 121-265, 62 FR 27922, May 21, 1997; Amdt. 121-xxx, YY FR ZZZZZ, June xx, 2002]

§/JAR 25.1329 Flight Guidance System
[See AC/ACJ 25.1329]

(a) Quick disengagement controls for the autopilot and autothrust functions must be provided for each pilot. The autopilot quick disengagement controls must be located on both control wheels (or equivalent). The autothrust quick disengagement controls must be located on the thrust control levers. Quick disengagement controls must be readily accessible to each pilot while operating the control wheel (or equivalent) and thrust control levers.

b) The effects of a failure of the system to disengage the autopilot or autothrust functions when manually commanded by the pilot must be assessed in accordance with the requirements of §/JAR 25.1309.

(c) Engagement or switching of the flight guidance system, a mode, or a sensor must not produce a significant transient response affecting the control or flight path of the airplane.

(d) Under normal conditions, the disengagement of any automatic control functions of a flight guidance system must not produce any significant transient response affecting the control or flight path of the airplane, nor require a significant force to be applied by the pilot to maintain the desired flight path.

(e) Under other than normal conditions, transients affecting the control or flight path of the airplane resulting from the disengagement of any automatic control functions of a flight guidance system must not require exceptional piloting skill or strength to remain within, or recover to, the normal flight envelope.

(f) Command reference controls (e.g., heading select, vertical speed) must operate consistently with the criteria specified in §/JAR 25.777(b) and 25.779(a) for cockpit controls. The function and direction of motion of each control must be plainly indicated on, or adjacent to, each control if necessary to prevent inappropriate use or confusion.

(g) Under any condition of flight appropriate to its use, the Flight Guidance System must not:

- produce unacceptable loads on the airplane (in accordance with §/JAR 25.302), or
- create hazardous deviations in the flight path.

This applies to both fault-free operation and in the event of a malfunction, and assumes that the pilot begins corrective action within a reasonable period of time.

(h) When the flight guidance system is in use, a means must be provided to avoid excursions beyond an acceptable margin from the speed range of the normal flight

envelope. If the aircraft experiences an excursion outside this range, the flight guidance system must not provide guidance or control to an unsafe speed.

(i) The FGS functions, controls, indications, and alerts must be designed to minimize flight crew errors and confusion concerning the behavior and operation of the FGS. Means must be provided to indicate the current mode of operation, including any armed modes, transitions, and reversions. Selector switch position is not an acceptable means of indication. The controls and indications must be grouped and presented in a logical and consistent manner. The indications must be visible to each pilot under all expected lighting conditions.

(j) Following disengagement of the autopilot, a visual and aural warning must be provided to each pilot and be timely and distinct from all other cockpit warnings.

(k) Following disengagement of the autothrust function, a caution must be provided to each pilot.

(l) The autopilot must not create an unsafe condition when the flight crew applies an override force to the flight controls.

(m) During autothrust operation, it must be possible for the flight crew to move the thrust levers without requiring excessive force. The autothrust response to flight crew override must not create an unsafe condition.